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• *Electronics industry – Financial crisis – China – Pearl River Delta*

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Crisis and Recovery in the Pearl River Delta. Growth and Employment in the Electronics Industry

Krise und Erholung im Perlflussdelta. Wachstum und Beschäftigung in der Elektronikindustrie

With 2 Figures and 6 Tables

Compared with most other regions and industries in China, the electronics industry in the Pearl River Delta (PRD) has been hit hard by the crisis of 2008 and 2009. Numerous companies have ceased operations and thousands of workers have been laid off. The orientation of the electronics industry towards exporting low-cost products has proven to be a point of weakness in this ongoing crisis. The aims of this article are threefold: firstly, to highlight the key reasons for the crisis and the Pearl River Delta's susceptibility to it; secondly, to analyse the channels through which the global crisis affected the PRD, and thirdly, to analyse the immediate effects on companies. All analyses are based on firm-level data acquired in 2009 with support from DFG SPP 1233. They show that the crisis has mainly affected the internationally oriented companies in the PRD.

1. Introduction

Ten years after the Asian crisis of 1997, the global financial crisis of 2008 (or financial tsunami, as it is called in East Asia) once again placed emerging economies in East Asia under severe pressure. In contrast to 1997, when the Chinese economy was not as integrated into the world market as it is today, China has been heavily hit by the economic pressure created by the recent crisis. In 2009 China's overall exports declined by more than 40 per cent. Important economic regions with a strong focus on exports suffered, and as a consequence, thousands of companies closed their businesses and millions of migrant workers lost their jobs. Due to their dependence on foreign trade with manufactured goods and foreign investments, the Pearl River Delta (PRD) and the Yangtze River Delta (YRD) were hit hardest by the effects of the financial crisis in the last quarter of 2008 (*Yu* and *Huang* 2009: 7). The PRD is the economic powerhouse of southern China and generated 79.4 per cent of the gross domestic product (GDP) of the

Guangdong province in 2008. The PRD is also responsible for 95.9 per cent of all exports and for 96.7 per cent of all imports for the province (Guangdong Statistical Yearbook 2009). The most important industry in the PRD is the electronics sector which accounts for more than 60 per cent of total manufacturing (Guangdong Provincial Bureau of Statistics 2009).

As *Cai* and *Chan* (2009: 513) point out, it is easy to define the exact starting point of the financial crisis in North America with the bankruptcy of Lehman Brothers on September 15th 2008; it is rather difficult, however, to define the exact date on which the waves of the financial tsunami reached the shores of the economy in the PRD. The economic data of the Guangdong Provincial Bureau of Statistics (2009) show that economic growth rates in Guangdong started to slow down in October 2008 and turned negative in November and December 2008. As demand for consumer goods in North America, Europe and Japan declined sharply in the fourth quarter of 2008, the impact on the economy in the export-oriented industries in the PRD was severe. The Chinese government responded immediately with a massive financial stimulus package to prevent the domestic economy from taking the same road towards an economic decline as the U.S. and Europe. The overall value of the economic stimulus was $ 586 billion, financed by the enormous fiscal resources of the Chinese state and several provinces (*Spence* 2009: 508, *Sun* 2009: 35). The aim of this financial stimulus was to maintain economic growth of at least 8 per cent for 2009 and to minimise the negative effects of the crisis. The main share of the financial stimulus package went into works designated for infrastructure projects, such as road and rail improvements and direct support for export-orientated sectors which faced major financial problems due to the decline in international trade. As the National Bureau of Statistics of China (2010) reports, GDP growth in 2009 for China was 8.7 per cent, with a 10.7 per cent rise in the fourth quarter of 2009 compared to the same quarter in 2008. Despite the massive economic pressure, the Chinese economy resisted the international trend of economic decline, but growth rates in 2009 were much lower than they were projected in 2008.

A dynamic perspective of rise and fall of regional economies is part of the concept of evolutionary economic geography, which links ideas of evolutionary processes to economic development (*Amin* and *Thrift* 2000, *Martin* and *Sunley* 2001). The basic idea is rooted in *Schumpeter's* concept of 'creative destruction' of economic landscapes and the fundamental question how changes in these landscapes occur (*Boschma* and *Martin* 2007: 539ff.). *Dopfer* and *Potts* (2004: 8ff.) point out that the basic economic structures like spatial agglomerations, industrial districts, clusters, cities etc. are manifestations of rules or knowledge and that the overall economic landscape is shaped by changes within the knowledge structure.

The academic literature has a strong focus on successful regions rather than on failing ones, because they display a greater capacity for collective action and the ability to learn. *MacKinnon* et al. (2009) point out that "[...] such failure often reflects how inherited routines and practices [...] can become disadvantageous as economic circumstances change". In this view economic actors become locked in traditional ways of doing things (*Grabher* 1993a: 256).

In this view the collapse or sharp decline of whole economic sectors is not a new phenomenon.

Comparing the financial crisis in developed countries with those in developing countries, it could be observed that the recent crisis manifested itself differently according to industrial sectors. In developed countries, reduced consumption led to pressure in the import-oriented industries, while developing countries saw a strong downturn within their export industries. As *Lai* (2010: 48) points out, there is a lack of

systematic studies concerning both the causes and the policy solutions of industry collapse or decline. He mentions works by *Brown* (1993), who documents the collapse of the British toy industry during the period of 1979-1984, *Marchionatti* (1995), who analyses the decline of the British cotton industry in the 1920s, and *Boothman* (2000), who focuses on the collapse of the Canadian pulp and paper industry during the period 1919-1932. The subjects of these studies are industry collapse or decline, mainly in developed countries.

In the wake of the recent financial crisis, new literature has emerged which focuses on industry decline in emerging economies, although there is still a lack of studies dealing with sharp decline in export-oriented sectors in emerging economies in East Asia. *Lai* (2010) focuses on the external demand decline which caused the downturn of the export industry in the Chinese economy, while *Fidrmuc* and *Korhonen* (2010) analyse the impact of the financial crisis on business cycles in Asia's emerging economies, and *McKay* and *Song* (2010) ask if the impact of the financial crisis has led to a structural adjustment in the Chinese economy. They conclude that the crisis is a good opportunity for the Chinese government to develop new policies towards a more sustainable development of the economic sector. *Sun* (2009) investigated the resilience of China's economy to the financial tsunami and concluded that the financial stimulus from the government and the robust Chinese domestic market saved the economy from a severe downturn. While many of these studies focus on the economy as a whole, there is still a lack of literature which focuses on specific geographical regions and how those have been affected by the recent crisis.

The purpose of this article is to assess the impact of the global financial crisis and the resulting economic downturn and recovery in the PRD. The focus here lies on the electronics sector, which is the most dominant industry within this region. The aim of this article is, firstly, to highlight the key reasons for the economic decline in the PRD in the last quarter of 2008, secondly, to analyse its immediate effects, and thirdly, to assess the response and the recovery of companies in the electronics sector in 2009. The paper is structured as follows: The next section presents a literature survey on the channels through which the effects of the financial crisis spread to the Chinese economy. Section 3 presents the survey data, while Section 4 focuses on empirical data regarding foreign trade, financial development and inward investments. The final section provides a discussion and a conclusion.

2. Key Reasons for the Economic Downturn in Emerging Economies

The global financial crisis had its origin in the bursting of the real estate bubble in North America, which led to a global banking and credit crisis. The events on Wall Street in September 2008 spread like shockwaves in developed as well as in developing economies. *Naudé* (2010: 213f.) summarises the elements which led to the financial crisis: easy credit, bad loans, weak regulation and supervision of complex financial instruments, debt defaulting, insolvency of key financial institutions, a loss of credibility and trust, financial panic and mass selling-off of stocks, and a hoarding of cash by banks and individuals. Due to the connectivity of the financial markets, the crisis spread quickly, creating the so-called 'credit crunch'. The effects of the crisis were a sharp decline in consumption, investments and trade in North America, Europe and Japan. Although the epicentres of the crisis were in North America and Europe, the impact of the financial crisis was severe in emerging economies. Due to the strong integration into the world market, growth rates in East Asia slowed down and export industries faced severe economic

pressure (*Chen* and *De Lombaerde* 2010: 106). *Feldstein* (2003) gives an overview of how economic and financial crises spread from developed countries into emerging economies. In almost all observed cases in recent decades, a drop in consumption in the developed countries led to an economic downturn in emerging markets all over the world. Weak legal systems, underdeveloped financial institutions, as well as fragile domestic markets often result in an even sharper economic decline.

Little conceptual work has been published on the effects of the crisis on newly industrialising countries. One attempt is *Naudé'*s (2009: 4) discussion of three channels of shock transmission to developing countries, a reduction of export earnings, a reduction of domestic lending, and a reduction of foreign financial flows, which will function as a conceptual basis for the analysis undertaken in this paper.

Firstly, a reduction in earnings from exports can cause a massive economic downturn. This effect can be observed particularly in countries which are tightly intertwined commercially (*Tirole* 2002: 12). The economic success of the PRD is linked to the supply of cheap labour, the export orientation of the companies, the geographical proximity to Hong Kong (HK) and supportive government policies during the last few decades. As *Revilla Diez* et al. (2008: 265) point out, the long-term success of the PRD is due to agile firm organisation, which consists of both informality and flexibility. Many HK companies have relocated their production facilities to the PRD, while headquarters, R&D, marketing and finance have all remained in HK. These companies have adopted well-established 'low technology' production processes, which were developed elsewhere, and have improved the production to gain competitiveness and market share (*Davies* 1996: 689). Since 2001, the relocation process of production to the PRD has accelerated significantly. The reasons for this include a stronger integration of the HK economy with that of mainland China and an increase in partnerships between HK businesses and government officials in the PRD (*Meyer* 2008: 25). Scholars call this business model 'Hong Kong Model' or 'front office, back factory'. In recent years, companies from Taiwan and from developed countries have also adopted this business model. Facilities in the PRD mainly import raw materials, equipment and core technology, while manufactured goods are exported (*Hürtgen* et al. 2009: 123f., *Meyer* et al. 2009: 229f., *Lai* 2010: 58).

The export sector is one key to the economic success of the PRD. A major share of the overall economic growth in China, and especially in the PRD, is based on the performance of the export sector. Due to the decline in world trade in 2009, it is expected that the drop in demand for consumer goods in North America, Europe and Japan will result in major pressure on the export-oriented industry in China (*Spence* 2009: 504). The International Monetary Fund (2011) reports that world trade declined by 10.9 per cent in 2009, compared to a 2.8 per cent growth in 2008. The Chinese economy in 2009 was much more integrated into the global economy than it had been a decade ago. Spatial patterns of Chinese exports have changed significantly during the last two decades, moving towards a more diversified geographical distribution. In 1991, almost half of all Chinese exports were sold to HK, while in 2008, the main destinations for Chinese exports were the EU (20.07 per cent), the U.S. (18.39 per cent), HK (13.59 per cent) and Japan (8.12 per cent) (*Chou* et al. 2009: 534). As a region dominated by export-oriented production and similar trade patterns, it is expected that the PRD is strongly affected by a decline in foreign trade.

Secondly, banking failures can lead to a reduction in domestic lending. Banking failure has direct implications for the manufacturing sector and for international trade. In line with *Naudé'*s (2009)

arguments, *Dell'Ariccia* et al. (2008) conclude that during financial crises, industry sectors which rely on external finance face lower growth rates than those sectors which are less dependent on external finance. The reason for this correlation is that companies finance their production with short-term credits. In times of crisis, the overall capital flow decreases while the uncertainty increases. This situation results in difficulties for companies in accessing credits, as almost 90 per cent of world trade is financed by short-term credits. In this situation, a 'credit crunch' can have severe implications for the global economy.

In the case of bank lending, there is no such threat to the Chinese economy, because the financial system is largely government-regulated and foreign banks control only a small market share. Furthermore, the financial markets in China are heavily regulated and only a few banks participated in trade with American sub-prime mortgages (*Naudé* 2009: 7). As *Sun* (2009: 32) points out, Chinese banks do not need to react to the crisis by cutting back lending. In fact, Chinese banks have been gearing up leverage and pumping much-needed liquidity into the economy, with bank loans increasing by 34.4 per cent in July 2009 compared to July 2008.

Another source of finance for companies in the PRD are the stock markets in Shenzhen, HK and Shanghai. Their indices declined in the aftermath of the financial crisis, as did all major indices in East Asia. A drop of more than half their value in the third and fourth quarter of 2008 could be observed for both Chinese indices and for the Hang Seng index in HK. The link between falling stocks and the financial crisis is limited, as falling indices have been evident in China since late 2007 due to an overheating economy (Shenzhen Stock Exchange 2010).

Thirdly, financial crisis can lead to a reduction of financial flows from developed to developing economies. Private investments and remittances to developing countries declined massively in 2009 by around 300 to 400 billion US dollars. Remittances and aid flows saw a particularly strong decline (*Naudé* 2009: 6). *Chen* and *De Lombaerde* (2010: 98f.) point out that declining foreign investments were one of the main reasons for the East Asian and Pacific region to feel the impacts of the recent crisis, although the financial institutions in the region had relatively healthy positions and their exposure to sub-prime credits was limited. The financial crisis had a significant effect on global foreign direct investment (FDI) flows. After steady growth in the period of 2003-2007, global FDI inflows fell by 14 per cent to $ 1,697 billion in 2008 from a record high of $ 1,979 billion in 2007. In the first half of 2009, FDI flows fell at an accelerated rate (UNCTAD 2009: 3f.).

In the last two decades, FDI inflow has become more important for the Chinese economy and since 1993, inward FDI flows into the Chinese mainland have grown steadily with the result that the country surpassed the United States as the world's largest FDI recipient in 2001 (*Fan* et al. 2009: 854). *Whalley* and *Xin* (2010: 134) conclude that the share of foreign invested enterprises (FIE) in China's economy reached over 20 per cent and contributed over 40 per cent of China's economic growth in 2004. Without FDI inflow, the GDP growth rate for 2004 would have been lower by around 3.4 percentage points. The financial crisis had a significant effect on FDI inflow into the Chinese mainland, which fell by 20.56 per cent from $27.414 million in the first quarter of 2008 to $21.777 million in the first quarter of 2009 (UNCTAD 2009: 51).

Taking into account the theoretical discussion and the channels of shock transmission, three hypotheses for the reaction of the economy in the PRD emerge:

- Companies with a strong focus on export markets were affected more by the financial crisis than companies with a focus on the Chinese domestic market.

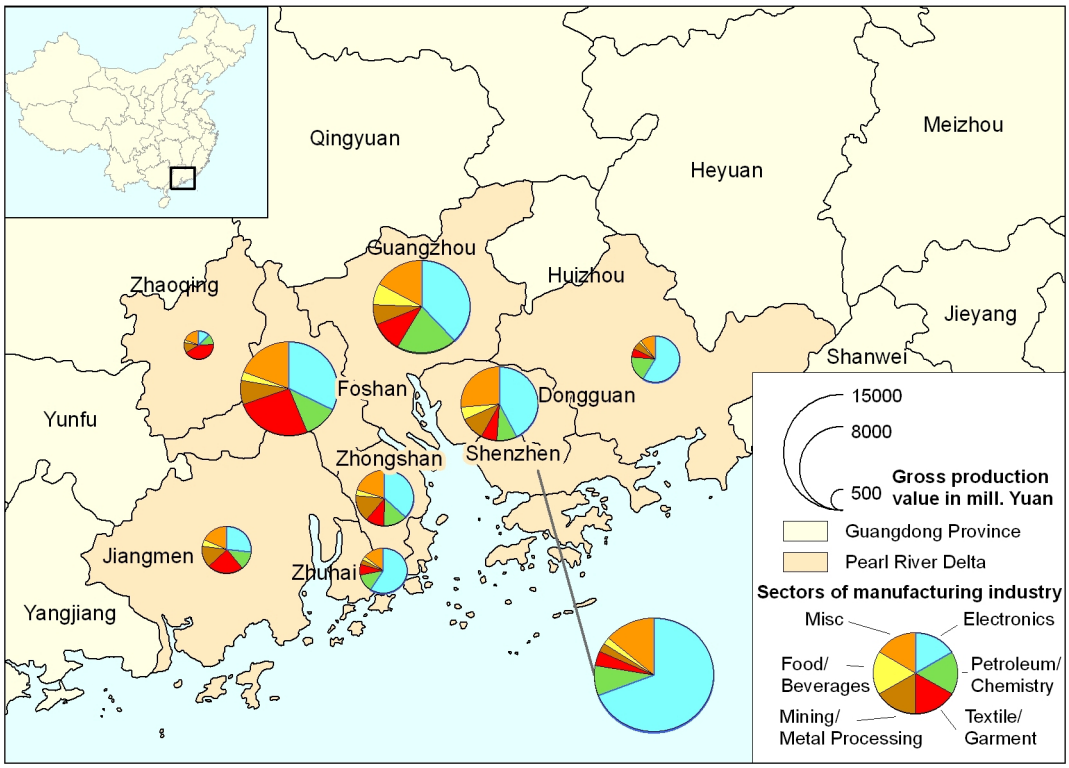

Fig. 1 Shares of sectors in total manufacturing industry in the PRD 2008 (Guangdong Statistical Yearbook 2009)
Anteil unterschiedlicher Sektoren am produzierenden Gewerbe im Perlflussdelta 2008 (Guangdong Statistical Yearbook 2009)

- Due to heavy regulation of the financial market in China, banking failure and the reduction in domestic lending did not occur in the PRD.

- Companies with foreign investments faced higher pressure than companies without foreign investments.

3. Data and Methods

The data is based on a company survey of 417 companies from the electronics sector in the PRD, which was conducted between September and November 2009. The focus was on innovation and upgrading activities as well as on the economic situation of the companies in the eastern part of the PRD (*Fig. 1*). The questionnaire itself was divided into five main categories: Market and Strategy, Organisation and Marketing, Product and Process Development, Human Resources and External Contacts. The overall profile of the companies surveyed is shown below in *Table 1*. The company selection was random and was contacted by phone; while the questionnaire itself was sent by mail, addressed to the CEO or management personnel.

The research was funded by a grant from Deutsche Forschungsgemeinschaft (DFG, German Research Foundation), priority programme ‘Megacities – Megachallenges: The

Tab. 1 Profile of responding firms with N = 417 (own calculation based on survey data) / *Profil der teilnehmenden Unternehmen mit N=417 (eigene Berechnungen auf der Befragungsdaten)*

Regions	Number of firms
Shenzhen	168 (40.29 %)
Dongguan	175 (41.97 %)
Huizhou / Heyuan	74 (17.74 %)

Total employment	Number of firms
Mean/maximum/minimum	738/18.000/4
Less than 50 employees	69 (16.6 %)
51-100 employees	59 (14.2 %)
101-500 employees	177 (42.5 %)
501-1000 employees	51 (12.3 %)
1000+ employees	60 (14.4 %)

Share of export in sales	Number of firms
0-25 %	182 (43.5 %)
25-50 %	76 (18.2 %)
50-75 %	49 (11.7 %)
75-100 %	111 (26.6 %)

Revenue in 2008 in RMB	Number of firms
Less than 1 Million	30 (7.7 %)
1 Million – 10 Million	131 (33.7 %)
10 Million – 100 Million	137 (35.2 %)
100 Million – 1 Billion	72 (18.5 %)
More than 1 Billion	19 (4.9 %)

Registration in the PRD	Number of firms
State owned	3 (0.72 %)
Collectively owned	8 (1.92 %)
Chinese owned private	244 (58.51 %)
Wholly foreign owned	123 (29.5 %)
Chinese foreign equity	32 (7.67 %)
Chinese foreign cooperative	7 (1.68 %)

Years of experience in the PRD	Number of firms
Mean/maximum/minimum	9,48/56/0

Informal Dynamics of Global Change'. The survey was conducted in cooperation with the geographical department of the Sun-Yatsen University in Guangzhou and is part of the cooperative project 'Regional Agility and Upgrading in HK and the PRD'. In addition to the survey, 36 interviews with experts and companies were carried out in HK and the PRD.

The research focused on the cities of Shenzhen, Dongguan, Huizhou and Heyuan. Shenzhen stands, therefore, as the economic core of the eastern PRD, where the economic development started very early with the establishment of the first Chinese special economic zone in 1978. The development in Dongguan was ignited mainly by foreign direct investments from HK and Taiwan years later, while the cities of Huizhou and Heyuan are good examples of peripheral development. For a more detailed overview of the economic development in the PRD see *Veeck* et al. (2007: 263ff.) for the illustration of reforms and challenges in China's industrial sector, while *Yang* (2006) analyses regional development in global production networks in the PRD, and *Lu* and *Wei* (2007) observe domestic globalisation and economic polarisation in the Guangdong province.

Tab. 2 Foreign trade development in the Guangdong Province (2008-2010) on a monthly year-to-year basis compared to the year before (Guangdong Provincial Bureau of Statistics 2010) / *Entwicklung des Außenhandels in der Provinz Guangdong (2008-2010), jeweils im Vergleich zum selben Monat des Vorjahres*

		Total trade value (bn US$)	Growth rate (%)	Export value (bn US$)	Growth rate (%)	Import value (bn US$)	Growth rate (%)
2008	July	64.26	17.6	37.09	17.0	27.17	18.6
	August	62.56	10.0	36.96	11.7	25.60	7.7
	September	65.78	12.2	39.11	14.8	26.66	8.5
	October	60.69	7.1	36.80	9.2	23.89	3.9
	November	53.35	-12.2	33.85	-5.1	19.50	-22.2
	December	52.02	-13.6	32.37	-6.8	19.65	-22.9
2009	January	36.65	-31.0	24.19	-23.6	12.46	-42.0
	February	41.66	-16.9	27.06	-32.7	14.60	-22.1
	March	44.79	-14.3	27.25	-14.3	17.54	-23.7
	April	47.14	-18.1	27.69	-16.1	19.45	-20.9
	May	45.97	-22.1	26.86	-21.2	19,11	-23.4
	June	49.38	-15.0	28.03	-18.0	21.36	-10.8
	July	54.82	-14.7	31.60	-14.8	23.22	-14.5
	August	53.64	-14.7	31.26	-16.2	22.38	-12.6
	September	60.60	-8.3	34.68	-12.0	25.92	-2.8
	October	55.18	-9.4	33.33	-10.0	21.85	-8.5
	November	60.01	12.4	34.71	2.4	25.30	29.7
	December	68.82	32.3	39.97	23.5	28.84	46.7
2010	January	48.86	33.4	28.32	17.0	20.54	65.2
	February	43.67	28.3	24.95	28.5	18.72	28.2
	March	60.64	35.4	32.66	19.8	27.99	59.5

4. Impacts and Effects of the Financial Crisis in the PRD

The economic downturn and the decline in foreign trade in the PRD due to lower demand for consumer goods on international markets and massive cancellation of orders in the fourth quarter of 2008 were dramatic. China's overall exports for the first half of 2009 reached the volume of US$ 521.8 billion, which was 21.7 per cent below the volume of the first half of 2008. Compared with other major economies, the decline in exports for China was rather gentle. The United States faced a decline

in exports of 23.8 per cent, South Korea of 22.7 per cent and most of the European economies of more than 30 per cent (*Cai* and *Chan* 2009: 525); emerging economies were hit hard as well with an even higher decline (*Nanto* 2009: 5, *Liu* et al. 2009: 499).

4.1 Foreign trade development in the PRD

The economic situation in the PRD was bleak and foreign trade figures collapsed by more than 30 per cent on a monthly year-to-year basis, as shown in *Table 2*. Foreign trade started to slow down in October 2008 and turned negative in November 2008. Negative trade development continued and growth rates sank to minus 31 per cent in January 2009. An even more dramatic development can be observed in import figures, where growth rates slumped to minus 42 per cent in January 2009. In the first and second quarter of 2009, foreign trade in the PRD reached its lowest point, but two-digit negative growth rates continued even during the third quarter of 2009, with rates of minus 15 per cent during the northern summer months. An economic recovery occurred in September and October and growth rates in foreign trade reached negative single-digit figures. Negative growth rates on a monthly year-to-year basis plummeted in the last quarter of 2009 due to the dramatic decline in 2008, and turned positive in November 2009. Growth rates have risen dramatically since November 2009 with figures for foreign trade of more than 30 per cent. Imports grew even more, with an increase of over 60 per cent in January 2010. These are astonishing figures, but one must keep in mind that import figures in the first quarter of 2009 were at a very low level.

The development of foreign trade during the financial crisis shows that imports can be an early indicator for the further development of exports. *Chen* and *De Lombaerde* (2010: 94) estimate that roughly 50 to 60 per cent of China's exports to the U.S. would be at risk if important components and core technology could not be imported. This connection occurred in the PRD in the last quarter of 2009, when imports increased substantially while exports followed a month later. However, making a final judgement about this interdependency and formulating a better projection of short-term trade development in the PRD extends beyond the scope of this article, and thus requires further research.

4.2 Decline in trade and export earnings

Declining foreign trade has strong implications for the PRD, because many companies produce for international markets. The data collected show that the average shares of exports account for 42.86 per cent of sales, while 56.98 per cent of sales are generated in the Chinese domestic market. The most important export markets for the companies in the PRD are HK (8.21 per cent) and Taiwan (7.7 per cent). Other international export destinations account for 27.1 per cent.

Due to impressive foreign trade expansion in the Chinese economy over the last few years, growth rates of the firms surveyed in the PRD have been very high recently. Average growth rates in sales were at an astonishing level of 27.57 per cent (standard deviation [s.d.] 33.851) in 2007 and remained high in the first half of 2009 even after a fall to 21.51 per cent (s.d. 45.099). Despite the economic downturn in global markets, the performance of companies in the PRD in the first half of 2009 was very impressive. In a few cases, growth rates of more than 200 per cent occurred due to massive orders by the Chinese government. The average growth rates for net profit in 2007 were at 17.79 per cent (s.d. 26.511), even reaching 13.13 per cent in the first half of 2009 (s.d. 30.121). The high standard deviation for the 2009 figures suggests that the variation of growth rates was much greater than in 2007.

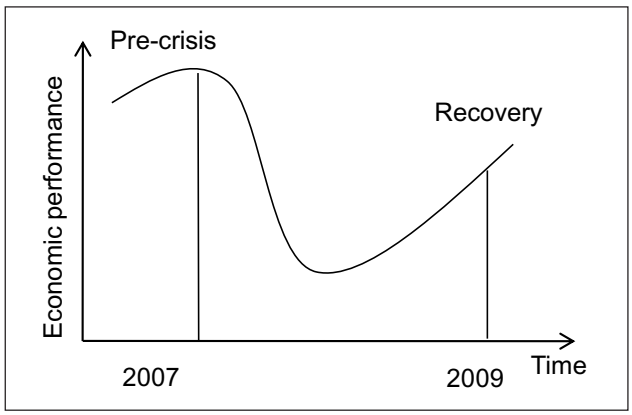

Fig. 2 Schematic overview of growth development in the PRD (authors' own figure) / *Schematische Darstellung der Entwicklung im Perlflussdelta (eigene Darstellung)*

As a response to falling growth rates in sales and net profit, a reduction of 7.3 per cent occurred in the average total workforce. In total employee numbers, the average workforce per company dropped from 796.9 to 737.8. Following the sharp decline of the economy in the PRD in the fourth quarter of 2008, as reported in early 2009 (Business Week 2009, *Bradsher* 2009), the region entered a phase of strong recovery in the first half of 2009, as shown in *Figure 2*. Growth rates rose in this time, but the overall economic level was still lower than in 2007 and 2008.

For a further analysis, the sample was divided into two reference groups in order to get a more detailed understanding of growth rates in sales, net profit and workforce development for export-oriented and domestic-market oriented companies. As shown in *Table 3*, growth rates in the first half of 2009 were lower than in 2007 for both groups of companies. Companies with an export orientation were better off in terms of growth rates in sales and net profit than domestic-market oriented companies. This finding is congruent for 2007 as well as for the first half of 2009. In terms

Tab. 3 Comparison of growth rates in sales, net profit and average total workforce in companies which produce for the domestic market and companies with a high share of exports **x** in 2007 and 2009 (own calculation based on survey data) / *Vergleich der Wachstumsraten für Umsatz, Gewinn und Beschäftigung in Unternehmen mit hohem sowie niedrigem Exportanteil **x** in den Jahren 2007 und 2009 (eigene Berechnungen auf der Grundlage der Befragungsdaten)*

N		**x < 50%** (257)	**x > 50%** (157)	**Sig. (2-tail)** -
2007	**Growth rate: sales**	27.05	28.33	.748
	Growth rate: net profit	17.53	18.17	.838
	Total workforce	489.41	1223.6	.001
2009	**Growth rate: sales**	19.84	24.41	.407
	Growth rate: net profit	10.98	16.98	.141
	Total workforce	485.1	1111.73	.001

Tab. 4 Sources of finance according to export share, in per cent (own calculation based on survey data) *Finanzquellen gegliedert nach Exportanteil in Prozent (eigene Berechnungen auf der Grundlage der Befragungsdaten)*

Share of export in sales (%) (N)	**0 - 25** (142)	**25 - 50** (61)	**50 - 75** (42)	**75 - 100** (90)	**Sig. (2-tail)** -
Chinese bank	33.40	31.80	35.24	18.41	.009
Foreign banks (incl. HK Banks)	5.11	10.93	18.21	26.18	.000
Stock market	1.40	1.64	5.36	1.11	.031
Parent/affiliate company	9.44	11.15	13.45	19.70	.082
Family members/friends	50.65	44.48	27.74	35.57	.008
Total	100	100	100	100	-

of workforce, a structural difference between these two groups could be observed.

Export-oriented companies in the PRD employ more than double the number of workers employed by domestic-market oriented companies. In comparison, workforce development was different. While export-oriented companies reduced their workforce sharply from an average of 1223.6 employees in 2007 to 1111.73 in the first half of 2009 (Sig. [2-tail]: 0.156), domestic-market oriented companies maintained their workforce.

4.3 Banking failure and a reduction of domestic lending

Companies in the PRD access a broad array of financial sources. By far the most important are family members or friends, which account for an average of 42.63 per cent of all financial sources. Chinese banks also play a significant role, contributing an average share of 29.66 per cent of overall finance in the PRD. Further financial sources include parent or affiliate companies (13.03 per cent), HK banks (9.98 per cent), foreign banks (3.46 per cent) and the stock market in Shenzhen (1.86 per cent). Despite the fact that most of the major international banks have an operation in China, they are still of lesser importance as a financial source for companies. The data collected show that for most companies finance from HK and foreign banks in particular is not easily accessible. When asked how accessible financial sources are in the PRD, the response tended to be that family members and friends as a source of finance are very easy to access. On a five step scale (with 0 as not accessible and 5 as very easily accessible), the average figure for family members and friends is 2.61, followed by Chinese banks (1.75), HK banks (0.91), affiliate companies or business partners (0.90), foreign banks (0.42) and the stock market (0.42). These figures are in line with the distribution of average financial sources above. Foreign banks, including HK banks, are difficult to access and therefore play a minor role in company finance in the PRD.

This picture changes when put into the perspective of export orientation as shown in *Table 4*. The contribution of foreign banks to company finance increases along with the share of exports as a proportion of total sales. For companies with an export share of less than 25 per cent,

Tab. 5 Comparison of growth rates in sales, net profit and average total workforce in companies with a below and an above average share of finance from foreign banks (incl. HK banks) in 2007 and 2009 (own calculation based on survey data) / *Vergleich der Wachstumsraten für Umsatz, Gewinn und Beschäftigung in Unternehmen mit hohem sowie niedrigem Finanzierungsanteil von ausländischen Banken (inkl. HK-Banken) in den Jahren 2007 und 2009 (eigene Berechnungen auf der Grundlage der Befragungsdaten)*

N		**x < 25%** (260)	**x > 25%** (76)	**Sig. (2-tail)** -
2007	**Sales**	24.91	30.99	.320
	Net profit	16.42	18.09	.592
	Total workforce	605.74	1322.2	.052
2009	**Sales**	19.28	26.01	.377
	Net profit	11.73	14.63	.421
	Total workforce	587.38	1131.8	.061

foreign banks (including HK banks) contribute an average of 5.11 per cent of overall finance, while for companies with a 50 to 75 per cent share of exports, the contribution increases to 18.21 per cent. Companies with an export share of more than 75 per cent rely even more heavily on finance from foreign banks, with the average share increasing to 26.18 per cent. At the same time, the importance of family members and friends as a source of finance decreases significantly.

As it turns out, the stock market as a financial source is not accessible for many companies. The system of going public in China is biased towards successful state-owned enterprises (SOE), and regional governments select better-quality SOEs because they have a natural advantage of information acquisition over private enterprises. This government-controlled system is in place because it ensures a smooth development of the Chinese financial market. In the long run, this system is not effective, and *Du* and *Xu* (2009: 823) argue that there is a need for strengthening the market mechanism. The stock market contributes only a minor share of company finance, and even companies with high exports do not rely on the stock market as a source of finance.

In line with the analyses above, the sample was divided into two groups. The first group has an average share of foreign bank investment (including HK banks) which is below 25 per cent, while the second group has a share above 25 per cent.

As shown in *Table 5*, companies in both groups had a lower growth rate in sales and net profit in the first half of 2009 than in 2007. Companies with a high share of foreign bank finance had a better performance in sales and net profit in 2007 and in the first half of 2009 than companies with a low share of finance from foreign banks. Similar structural differences became apparent between these two groups as between export-oriented and domestic-market oriented companies. Companies with a high share of finance from foreign banks had a significantly larger workforce than companies with a low share of finance from foreign banks. Total workforce figures declined for both groups, but the decline in workforce was only significant in companies with a high share of finance from foreign banks (Sig. [2-tail]: 0.074).

Tab. 6 Comparison of growth rates in sales, net profit and average total workforce in companies with or without foreign investment in 2007 und 2009 (own calculation based on survey data) / *Vergleich der Wachstumsraten für Umsatz, Gewinn und Beschäftigung in Unternehmen mit und ohne ausländischen Investitionen in den Jahren 2007 und 2009 (eigene Berechnungen auf der Grundlage der Befragungsdaten)*

N		**No foreign investment** (232)	**With foreign Investment** (186)	**Sig. (2-tail)** -
2007	**Sales**	27.14	22.81	.204
	Net profit	22.81	16.05	.889
	Total work force	634.96	1391.84	.017
2009	**Sales**	18.19	20.95	.608
	Net profit	11.41	16.68	.223
	Total workforce	620.24	1301.26	.011

4.4 Reduction of financial flows

Foreign direct investments have become very important in the PRD in recent years. 38.9 per cent of the companies observed have a foreign investor, while 61.1 per cent are Chinese-owned. More than half (58.5 per cent) of the companies in the PRD are private Chinese-owned companies. Chinese state-owned (0.7 per cent) and Chinese collectively owned companies (1.9 per cent) are uncommon in the electronics sector of the PRD. The most common company registration with a foreign investor is wholly foreign-owned (29.5 per cent), while equity-owned joint ventures of Chinese and foreign investors account for 7.7 per cent and Chinese-foreign cooperatives for 1.7 per cent. This ownership structure in the PRD reflects the strong contribution of foreign investments in recent years.

The figures for foreign investments in the PRD are higher than is reflected in the company registration. More than 44 per cent of all companies observed have foreign investments, while 55.5 per cent do not. The most important sources of foreign investments are based in Taiwan and HK due to good relations, a similar cultural heritage and language. Investments from Taiwan are a financial source in 37.1 per cent of all companies with foreign investment, followed by HK, which accounts for 34.41 per cent. Investments from Asia (15.05 per cent), the U.S. (7.53 per cent) and Europe (5.91 per cent) are lower than those from Taiwan and HK, and play only a minor role.

When companies with no foreign investment are compared to those with foreign investment, it can be observed that growth rates in sales and net profit in the first half of 2009 were lower than in 2007, as shown in *Table 6*. In companies without foreign investment, the growth rate in sales declined from 27.14 per cent in 2007 to 18.19 per cent in the first half of 2009, while growth rates in companies with foreign investment dropped from 22.81 per cent to 20.95 per cent. Net profit development declined in companies without foreign investment from 22.81 per cent in 2007 to 11.41 per cent in the first half of 2009, while in companies with foreign investment, growth rates increased slightly from 16.05 per cent to 16.68 per cent in the first half of 2009. Total workforce numbers declined in both groups, but companies with a foreign investment experienced a significant drop (Sig. [2-tail]: 0.045).

5. Discussion and Conclusion

The economic downturn in the PRD was severe in the fourth quarter of 2008 due to declining foreign trade and the overall weakness of the global economy in the months after the financial crisis. In the first half of 2009, the economy in the PRD entered a phase of recovery. The conceptual background of this paper was *Naudé's* (2009) argument of shock transmission from developed to developing countries. In the case of the PRD, the following results were obtained: Firstly, it was found that growth rates in sales and net profit in the first half of 2009 were significantly lower than in 2007 for all companies, however the overall economic performance was lower than a year before. Secondly, companies with a high reliance on exports usually enjoy higher growth rates than companies with a strong focus on the Chinese domestic market. Thirdly, a structural difference between these two company groups could be observed: Export-oriented companies employ more than double the number of workers of companies with an orientation towards the Chinese domestic market. The final observation was that only companies with a focus on exports, foreign banks' loans or foreign capital experienced a significant decline in total workforce numbers, while companies oriented towards the domestic market kept their workforce on a similar level to that of 2007. Thus, the channels for the transmission of the crisis exist as hypothesised by *Naudé* (2009). However, they mainly affect companies with a marked international orientation, which responded by reducing their workforce, while keeping high growth rates in sales and net profit.

The findings of this paper are in line with the arguments of *Schüller* and *Schüler-Zhou* (2009: 176) who asserted that the financial crisis had only a minor effect on the Chinese economy, as strong government intervention prevented a lasting recession. In 2007, investment, consumption and exports accounted for 4.3, 4.4 and 2.7 per cent of GDP growth respectively, while in the first half of 2009, this composition was much less balanced. Investment – mostly allocated by the Chinese government in the form of the financial stimulus package – and consumption accounted for 6.2 and 3.8 per cent respectively. Exports accounted negatively for 2.9 per cent. Despite the impressive recovery of the Chinese economy, *Overholt* (2010: 30) expects that "[...] there will be a hangover of bad loans in China as a result of the hasty approval of numerous projects that would never have passed reviews before the stimulus."

The local government's top priority in the PRD is a development towards more industrial upgrading and innovation as stated in the 'Outline of the Plan for the Reform and Development of the PRD (2008-2020)' released by the National Development and Reform Commission (NDRC). This development had already started before the financial crisis in early 2008, but efforts accelerated in 2009 and heavy investments were made by the local government. Another explanation for the minimal influence of falling foreign trade on company performance in China is formulated by *Sun* (2009: 40) who argues that the fall of growth rates in China from the beginning of the financial crisis onwards was caused not by falling exports, but by massive destocking. Once destocking was finished, domestic demand continued, with an increase in industrial production occurring in the second half of 2009 and the first quarter of 2010. Further research must clarify the contribution of the Chinese government in stabilising and fostering economic growth in the PRD. The question remains as to the way in which heavy involvement and regulation by the government can protect a regional economy in developing countries from the effects of a financial crisis in developed countries. More research has to be conducted to find out whether these results are transferable to other developing countries in East Asia and if the financial crises strengthened the evolution and agility of the electronics sector in the PRD.

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Summary: Crisis and Recovery in the Pearl River Delta. Growth and Employment in the Electronics Industry

Compared with most other regions and industries in China, the electronics industry in the Pearl River Delta (PRD) has been hit hard by the current economic crisis. Numerous companies have ceased operations and thousands of workers have been laid off. The orientation of the electronics industry towards exporting low-cost products has proven to be a point of weakness in this ongoing crisis. The aims of this article are threefold: firstly, to highlight the key reasons for the crisis and the Pearl River Delta's susceptibility to it; secondly, to analyse the channels through which the global crisis affected the PRD, and thirdly, to analyse the immediate effects on companies. All analyses are based on firm-level data acquired in 2009 with support from DFG SPP 1233. They show that the crisis has mainly affected the internationally oriented companies in the PRD. The results reveal structural differences between companies in the export sector and those focusing on the Chinese domestic market. Companies with a high export share employ double the size of workers than companies with a low share. The analysis discovered a significant decline of total workforce in companies in the export sector in the period from 2007 to 2009. Companies with a focus on the Chinese domestic market maintained their workforce at an unchanged level. Differences can also be observed in growth rates for sales and net profit. Companies in the export sector had slightly higher growth rates in sales and net profit before the crisis in 2007 and during the first half of 2009.

Zusammenfassung: Krise und Erholung im Perlflussdelta. Wachstum und Beschäftigung in der Elektronikindustrie

Im Vergleich zu ähnlich strukturierten Regionen und Industrien war die Elektronikindustrie im Perlflussdelta (China) den Folgen der globalen Finanzkrise in China am stärksten ausgesetzt. Eine Vielzahl von Unternehmen musste infolge der Krise den Betrieb einstellen und Tausende von Arbeitnehmern entlassen. Die Ausrichtung der Elektronikindustrie im Perlflussdelta bezüglich einer exportorientierten Strategie stellte sich in der gegenwärtigen Krise als möglicher Schwachpunkt für die gesamte Region heraus. Dieser Artikel verfolgt drei Zielsetzungen: erstens die Hauptgründe für die Anfälligkeit der Elektronikindustrie im Perlflussdelta aufzuzeigen, zweitens die direkten Auswirkungen der aktuellen Krise auf die Unternehmensperformance und die Entwicklung der Beschäftigung zu analysieren und drittens die Reaktionen der Unternehmen zu diskutieren. Der Schwerpunkt liegt hierbei auf Anstrengungen auf Unternehmensseite, die Anfälligkeit des Geschäftsmodells zu minimieren. Alle Analysen basieren auf Unternehmensdaten, die im Rahmen des DFG-Schwerpunktprogrammes 1233 im zweiten Halbjahr 2009 aufgenommen wurden. Die Ergebnisse zeigen, dass strukturelle Unterschiede zwischen Unternehmen mit hohem und geringem Exportanteil im Perlflussdelta auftreten. Exportorientierte Unternehmen beschäftigen doppelt so viele Arbeitnehmer wie Unternehmen mit niedrigem Exportanteil. Zudem fand eine signifikante Reduzierung der Beschäftigten in Unternehmen des Exportsektors zwischen 2007 und 2009 statt. Eine vergleichbare Entwicklung ist bei Unternehmen, die einen hohen Anteil des Umsatzes auf dem chinesischen Markt generieren, nicht zu beobachten. Unterschiede sind auch bei Wachstumsraten im Umsatz und beim Gewinn festzustellen. Unternehmen mit hohem Exportanteil wiesen sowohl vor der Krise als auch in der ersten Jahreshälfte 2009 höhere Wachstumsraten auf.

Résumé: Crise et régénération dans le Pearl River Delta (PRD). Croissance et emploi dans l'industrie électronique

Comparé avec autres régions et industries avec une structure similaire, l'industrie électronique dans le Pearl River Delta (PRD) en Chine a été touché le plus durement par la crise économique actuelle. De nombreuses entreprises ont cessé leurs activités et des milliers de travailleurs ont été licenciés. L'orientation de l'industrie de l'électronique vers l'exportation de produits à faible coût s'est avéré être un point de faiblesse dans cette crise. Les objectifs de cet article sont triple: d'une part, de mettre en évidence les principales raisons de la susceptibilité de la Pearl River Delta à la crise economique mondiale, d'autre part, d'analyser les effets directs de la crise sur les activités des entreprises et l'emploi, et, troisièmement, d'exposer les réactions des entreprises. Toutes les analyses sont fondées sur des données au niveau des entreprises acquises en 2009 avec le soutien de la projet de rechèrche DFG SPP 1233. Les résultats montrent des différences structurelles entre les entreprises orientés vers l'exportation et celles qui se concentrent sur le marché intérieur chinois. En moyenne, le nombre d'employées dans les entreprises avec une grande portion d'exportation est double le nombre dans des compagnies avec une proportion faible. L'analyse a découvert une baisse significative de l'effectif total dans les entreprises du secteur des exportations dans la période allant de 2007 à 2009. Les entreprises avec un accent sur le marché intérieur chinois ont maintenu leurs effectifs à un niveau inchangé. Des différences peuvent également être observées dans les taux de croissance des ventes et du bénéfice net. Les entreprises du secteur de l'exportation ont enregistré des taux de croissance légèrement supérieur au chiffre d'affaires et le bénéfice net avant la crise en 2007 et pendant la première moitié de 2009.

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